

### **DETAILED ACTION**

Claims 1, 3-5, 8, 10, 12, 27-30 and 32-35 are pending as amended on 11/19/10.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 8/23/10 and 11/19/10 has been entered.

#### ***Response to Amendment***

Applicant's amendment (submitted 1/19/10) incorporating the limitations from dependent claim 7 into independent claim 1 is acknowledged. The rejections set forth herein have been modified from the rejections set forth in the action mailed 3/19/10 to reflect the amendment. An additional, new rejection has been made.

The objection to the figures (Exhibit 1) submitted 1/4/10 has been withdrawn as Applicant is no longer relying on the figures as evidence.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 34 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims fail to specify units, and are therefore indefinite. For the purposes of examination, the units are assumed to be wt%.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**1. Claims 1, 3-5, 8, 10, 12, 27-30, 32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), and **Toyozumi** (JP 2002-338770), and further in view of **Matsui** et al (JP 2002-248721).

As to claims 1, 8, 10, 34 and 35, Kuriu discloses a multilayered film consisting of three layers: a polyamide layer, a saponified ethylene-vinyl acetate layer, and a polyamide layer (columns 3-4, examples 1 and 2). In Example 2 (column 4, lines 9-17), Kuriu teaches that the polyamide layers comprise aliphatic polyamide (nylon-6) as the

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principal ingredient (86.0 wt %) and aromatic polyamide (poly(m-xylylene adipamide) in an amount of 10 wt % and a modified ethylene-vinyl acetate copolymer in an amount of 4.0 wt% (column 3, lines 54-56).

Kuriu fails to teach that the saponified ethylene-vinyl acetate copolymer layer comprises polyamide resin and an alcohol based compound.

Yamamoto discloses a composition which has excellent retort resistance comprising saponified ethylene vinyl acetate (herein EVOH) mixed with a polyamide resin and an alcoholic compound. (English patent abstract and [0004] of machine translation). Yamamoto teaches that this composition may be formed into a film or sheet [0011] and that other materials may be layered on one or both sides [0012].

Yamamoto teaches that EVOH is commonly used as packaging in the food industry, yet it is flawed in terms of its heat resistance, shock resistance and stiffness [0002]. Yamamoto discloses that it is known in the art to blend polyamide resin with EVOH to improve the aforementioned flaws [0002]. It would have been obvious, therefore, to one of ordinary skill in the art, to blend polyamide into Kuriu's EVOH layer in order to improve the heat and shock resistance, as well as stiffness, of the film. However, Yamamoto further teaches that EVOH/polyamide compatibility issues lead to deterioration of physical properties [0003]. Yamamoto teaches that such compatibility issues can be resolved by adding an alcohol-based compound [0004]. It would have been obvious, therefore, to one of ordinary skill, to add alcohol to the film comprising a blend of EVOH and polyamide, in order to avoid deterioration of physical properties due to incompatibility.

Yamamoto and Kuriu represent analogous art. Both disclose multilayer films comprising polyamide and EVOH layers for use in food packaging. Furthermore, both are attempting to reduce stiffness in film layers (Kuriu teaches that softening improves pinhole resistance - col 1, lines 19-25). Given Yamamoto's teaching that the physical properties of EVOH, including stiffness, can be improved by adding polyamide and alcohol, it would have been obvious to one of ordinary skill in the art to modify the EVOH layer taught by Kuriu (as in example 2) by adding polyamide and alcohol, as taught by Yamamoto, in order to improve the heat and shock resistance, and overall stiffness of the multilayer laminate.

As discussed above, Kuriu teaches that the aliphatic polyamide layer of the multilayer film further comprises 10 wt% aromatic polyamide and 4.0 wt% of a modified ethylene-vinyl acetate copolymer (column 3, lines 54-56). Kuriu fails to teach the addition of an ethylene-methacrylic acid copolymer ionomer.

Toyozumi discloses a composition comprising saponified ethylene vinyl acetate, polyamide, and an ionomer of an ethylene methacrylic acid copolymer [claim 1], [claim 5]. (Examiner note: ionomer is translated as "eye ONOMA.")

Toyozumi teaches that blends of EVOH and polyamide have nonuniform thickness, which leads to deterioration in gas barrier ("GASUBARIA") and pinhole resistance properties [0004]. Toyozumi discloses that the addition of an olefinically unsaturated carboxylic acid copolymer solves this problem [0005]. Toyozumi teaches a preferred copolymer from ethylene [0018] and methacrylic acid [0019], and teaches various metal ions for neutralization of the ionomer [0024]. Toyozumi teaches that the

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best gas barrier properties and pinhole resistance are achieved when the copolymer is present between 3-15 wt% [0029].

It would have been obvious, therefore, to one of ordinary skill in the art, to add ethylene methacrylic acid copolymer ionomer, as taught by Toyozumi, to the modified ethylene vinyl acetate containing polyamide layers of the multilayer film taught by Kuriu in view of Yamamoto, in order to improve uniformity, pinhole resistance and gas barrier properties of the layer.

Kuriu teaches that the film may contain organic additives such as antioxidants in typical amounts (col 2, lines 36-40). Kuriu fails to teach specific antioxidants, and therefore fails to disclose the presently claimed phenol-based antioxidant.

Matsui teaches a layered film containing a polyamide layer suitable for packing material subject to retort treatment [0001]. Matsui teaches that the polyamide film has excellent transparency and heat resistance [0002]. Matsui discloses the addition of an antioxidant to the polyamide and suggests the use of pentaerythrityl-tetrakis[3-3,5-di-*t*-butyl-4-hydroxyphenyl]propionate [0020] (a phenol-based antioxidant species recited in dependent claim 8). Given the teaching by Matsui that the antioxidant minimizes strength reduction of the polyamide film following retort treatment [0019], it would have been obvious to one of ordinary skill in the art to add the antioxidant to the polyamide layers in the laminates taught by Kuriu in view of Yamamoto and Toyozumi, in order to improve toughness of the film.

Regarding claim 3, Yamamoto teaches the addition of silica to the EVOH resin system [0011].

Regarding instant claim 4, Yamamoto discloses that the composition is prepared by mixing a polyamide resin with an alcoholic compound and then adding EVOH to the mixture (English patent abstract and [0004] of machine translation)

Regarding instant claim 5 both Kuriu and Yamamoto [0007] teach EVOH which fulfills the recited ethylene content and degree of saponification. The EVOH used by Kuriu in examples 1 and 2 contains 32 mol% ethylene and has a 99% degree of saponification (col 3, lines 55-58).

Regarding instant claim 12, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67.

Regarding instant claim 27, Yamamoto teaches that the composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

Regarding claim 28, Yamamoto discloses the claimed ratios exactly (English patent abstract).

Regarding instant claims 29 and 30, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67. In addition, Yamamoto discloses coextrusion [0012] as well as stretching by "two axes" (i.e. biaxial stretching) [0011].

Regarding instant claim 32, the two polyamide layers taught by Kuriu in Example 2 (column 4), fulfill the recitations of the instant claim. Both polyamide layers comprise 10 wt % aromatic polyamide. Therefore, one layer reads on the recitation of "at least

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one polyamide layer comprising aromatic polyamide in concentration of 2.0-10 wt%," while the other layer, as it contains aromatic polyamide, reads on the recitation of "at least one additional aromatic polyamide layer."

Regarding instant claim 33, Kuriu teaches that modified ethylene-vinyl acetate copolymers include each of the members recited in the instant claim (col 2, lines 20-25).

**2. Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, and further in view of **Tokoh** et al (US 5428094).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Matsui is incorporated here by reference.

If it is not considered obvious to add silica to the laminate made obvious by Kuriu in view of Yamamoto in Toyozumi based on the teachings of Yamamoto, Tokoh teaches that adding water-swellaable phyllosilicate to EVOH allows the resin to retain excellent gas barrier properties and good transparency even under highly humid conditions (col 2, lines 25-42). Given that Kuriu in view of Yamamoto, Toyozumi and Matsui teach subjecting the laminate to high humidity (retort), it would have been obvious to one of ordinary skill at the time the invention was made to add water swellaable phyllosilicate to the EVOH, as taught by Tokoh, in order to retain excellent gas barrier properties and good transparency.

**3. Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, and further in view of **Tanaka** et al (JP 2002-172742).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Matsui is incorporated here by reference.

Kuriu fails to teach the use of a primarily aromatic polyamide layer in the same multilayer film with a primarily ethylene vinyl acetate layer. While Yamamoto teaches the use of additional layers such as polyamide [0013], the reference fails to teach specific types of polyamide, and therefore fails to teach “aromatic polyamide.”

Tanaka teaches a biaxially stretched three layer laminate with an EVOH layer, an aliphatic polyamide layer and a xylylene (i.e. aromatic) polyamide containing layer (English patent abstract). Tanaka teaches that the laminates have excellent transparency and are highly suitable for packaging food. Tanaka discloses that layers of EVOH and polyamide are often laminated for use as packaging materials, due to the high gas barrier provided by EVOH and the pinhole resistance provided by polyamide [0002]. However, when stinky items are packaged, the smell leaks, restricting the use of such laminates for many foods [0002].



Tanaka teaches that adding an aromatic polyamide layer to a laminate of EVOH and aliphatic polyamide improves the smell retaining property of the laminate [0004] and [0012].

Given that Kuriu teaches the use of the multilayer films for packaging food (column 3, lines 24-27), it would have been obvious to one of ordinary skill in the art to add a layer of aromatic polyamide, as taught by Tanaka, to the multilayer film taught by Kuriu in view of Yamamoto, Toyozumi and Matsui, in order to improve the smell retaining property of the laminate.

**4. Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, as evidenced by **Shibuya** et al (JP 06-345919).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Matsui is incorporated here by reference.

Yamamoto teaches that the polyamide and alcohol EVOH composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

If not considered obvious that the multilayer transparent film disclosed by Kuriu in view of Yamamoto and Toyozumi would inherently have the transparency and boiling resistance as recited in instant claim 27, it would be obvious as evidenced by Shibuya.

Shibuya discloses a laminate composition comprising an inner layer of EVOH blended with polyamide and outer layers of polyamide resin (English patent abstract). Shibuya teaches that this multilayered laminate is useful as packaging for materials subject to retort or boil sterilization [0002, 0042, 0058]. Shibuya also teaches that there was no change in transparency in the three-layer laminate after 30 minutes in 95 °C water or 121 °C steam [0058 and 59].

As noted above, the multilayer film of Kuriu in view of Yamamoto, Toyozumi and Matsui is identical to the presently claimed, and identical compositions must have identical properties. Accordingly, one of ordinary skill in the art would assume that the properties of instant claim 27 are inherent to the films of Kuriu in view of Yamamoto, Toyozumi and Matsui, especially as evidenced by Shibuya.

**5. Claims 1, 3-5, 8, 10, 12, 27-30, 32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto et al** (JP 11-199741), and **Sugiura et al** (JP 10151714; included machine translation cited herein), and further in view of **Matsui et al** (JP 2002-248721).

As to claims 1, 8, 10, 34 and 35, Kuriu discloses a multilayered film consisting of three layers: a polyamide layer, a saponified ethylene-vinyl acetate layer, and a

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polyamide layer (columns 3-4, examples 1 and 2). In Example 2 (column 4, lines 9-17), Kuriu teaches that the polyamide layers comprise aliphatic polyamide (nylon-6) as the principal ingredient (86.0 wt %) and aromatic polyamide (poly(m-xylylene adipamide) in an amount of 10 wt % and a modified ethylene-vinyl acetate copolymer in an amount of 4.0 wt% (column 3, lines 54-56).

Kuriu fails to teach that the saponified ethylene-vinyl acetate copolymer layer comprises polyamide resin and an alcohol based compound.

Yamamoto discloses a composition which has excellent retort resistance comprising saponified ethylene vinyl acetate (herein EVOH) mixed with a polyamide resin and an alcoholic compound. (English patent abstract and [0004] of machine translation). Yamamoto teaches that this composition may be formed into a film or sheet [0011] and that other materials may be layered on one or both sides [0012].

Yamamoto teaches that EVOH is commonly used as packaging in the food industry, yet it is flawed in terms of its heat resistance, shock resistance and stiffness [0002]. Yamamoto discloses that it is known in the art to blend polyamide resin with EVOH to improve the aforementioned flaws [0002]. It would have been obvious, therefore, to one of ordinary skill in the art, to blend polyamide in the EVOH layer of Kuriu in order to improve the heat and shock resistance, as well as stiffness, of the film. However, Yamamoto further teaches that EVOH/polyamide compatibility issues lead to deterioration of physical properties [0003]. Yamamoto teaches that such compatibility issues can be resolved by adding an alcohol-based compound [0004]. It would have been obvious, therefore, to one of ordinary skill, to add alcohol to the film comprising a

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blend of EVOH and polyamide, in order to avoid deterioration of physical properties due to incompatibility.

Yamamoto and Kuriu represent analogous art. Both disclose multilayer films comprising polyamide and EVOH layers for use in food packaging. Furthermore, both are attempting to reduce stiffness in film layers (Kuriu teaches that softening improves pinhole resistance - col 1, lines 19-25). Given Yamamoto's teaching that the physical properties of EVOH, including stiffness, can be improved by adding polyamide and alcohol, it would have been obvious to one of ordinary skill in the art to modify the EVOH layer taught by Kuriu (as in example 2) by adding polyamide and alcohol, as taught by Yamamoto, in order to improve the heat and shock resistance, and overall stiffness of the multilayer laminate.

Kuriu teaches that, in order to give flexibility and pinhole resistance to a polyamide resin layer, a modified ethylene vinyl acetate copolymer may be added in an amount of 1 to 15 wt % (col 2, lines 1-25). However, Kuriu fails to teach the addition of an ethylene-methacrylic acid copolymer ionomer to the polyamide layer.

Sugiura teaches a laminate comprising a layer of a polyamide resin blended with 0.3-15 wt% of a flexible polymer, laminated to a layer of thermoplastic resin, such as EVOH, polyamide or a mixture (esp@cenet abstract, submitted by Applicant; also [0024]). Like Kuriu and Yamamoto, Sugiura teaches that the lamination film is suited for use in food packaging [0044].

Sugiura teaches that the addition of the flexible polymer to the polyamide prevents abrasive separation (abstract, [0021]). In addition, the laminate has excellent

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pinhole resistance, pliability and strength [0044]. As the flexible polymer, Sugiura teaches that ethylene vinyl acetate copolymer, or a mixture of ethylene vinyl acetate copolymer with an ethylenic methacrylic ionomer are preferred [0012, 0018, 0019].

In view of Sugiura's recognition that, for the purpose of flexibilizing polyamide resin, ethylene vinyl acetate copolymer is equivalent and interchangeable with a mixture of ethylene vinyl acetate copolymer with an ethylenic methacrylic ionomer, it would have been obvious to one of ordinary skill in the art to substitute the ethylene vinyl acetate copolymer component in the polyamide layer taught by Kuriu (in col 2, lines 9-25) in view of Yamamoto with a mixture of ethylene vinyl acetate copolymer and an ethylenic methacrylic ionomer, and thereby arrive at the present invention. Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

Kuriu teaches that the film may contain organic additives such as antioxidants in typical amounts (col 2, lines 36-40). Kuriu fails to teach specific antioxidants, and therefore fails to disclose the presently claimed phenol-based antioxidant.

Matsui teaches a layered film containing a polyamide layer suitable for packing material subject to retort treatment [0001]. Matsui teaches that the polyamide film has excellent transparency and heat resistance [0002]. Matsui discloses the addition of an antioxidant to the polyamide and suggests the use of pentaerythrityl-tetrakis[3-3,5-di-*t*-butyl-4-hydroxyphenyl]propionate [0020] (a phenol-based antioxidant species recited in

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dependent claim 8). Given the teaching by Matsui that the antioxidant minimizes strength reduction of the polyamide film following retort treatment [0019], it would have been obvious to one of ordinary skill in the art to add the antioxidant to the polyamide layers in the laminates taught by Kuriu in view of Yamamoto and Sugiura, in order to improve toughness of the film.

Regarding claim 3, Yamamoto teaches the addition of silica to the EVOH resin system [0011].

Regarding instant claim 4, Yamamoto discloses that the composition is prepared by mixing a polyamide resin with an alcoholic compound and then adding EVOH to the mixture (English patent abstract and [0004] of machine translation)

Regarding instant claim 5 both Kuriu and Yamamoto [0007] teach EVOH which fulfills the recited ethylene content and degree of saponification. The EVOH used by Kuriu in examples 1 and 2 contains 32 mol% ethylene and has a 99% degree of saponification (col 3, lines 55-58).

Regarding instant claim 12, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67.

Regarding instant claim 27, Yamamoto teaches that the composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

Regarding claim 28, Yamamoto discloses the claimed ratios exactly (English patent abstract).

Regarding instant claims 29 and 30, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67. In addition, Yamamoto discloses coextrusion [0012] as well as stretching by "two axes" (i.e. biaxial stretching) [0011].

Regarding instant claim 32, the two polyamide layers taught by Kuriu in Example 2 (column 4), fulfill the recitations of the instant claim. Both polyamide layers comprise 10 wt % aromatic polyamide. Therefore, one layer reads on the recitation of "at least one polyamide layer comprising aromatic polyamide in concentration of 2.0-10 wt%," while the other layer, as it contains aromatic polyamide, reads on the recitation of "at least one additional aromatic polyamide layer."

Regarding instant claim 33, Kuriu teaches that modified ethylene-vinyl acetate copolymers include each of the members recited in the instant claim (col 2, lines 20-25).

Regarding instant claim 35, Kuriu teaches 1 to 15 wt % of flexibilizing modified ethylene vinyl acetate copolymer in the polyamide resin layer. In substituting a mixture of ethylene-vinyl acetate copolymer and ethylene methacrylic ionomer (as made obvious by Sugiura), one would immediately envisage a 1:1 mixture of the two components, adding up to 1 to 15 wt%. As such, the ranges recited in instant claim 35 are deemed obvious.

**6. Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of

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**Yamamoto** et al (JP 11-199741), **Sugiura et al** (JP 10151714) and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, and further in view of **Tokoh** et al (US 5428094).

The above rejection over Kuriu in view of Yamamoto, Sugiura and Matsui is incorporated here by reference.

If it is not considered obvious to add silica to the laminate made obvious by Kuriu in view of Yamamoto, Sugiura and Matsui, Tokoh teaches that adding water-swellaable phyllosilicate to EVOH allows the resin to retain excellent gas barrier properties and good transparency even under highly humid conditions (col 2, lines 25-42). Given that Kuriu in view of Yamamoto, Sugiura and Matsui teach subjecting the laminate to high humidity (retort), it would have been obvious to one of ordinary skill at the time the invention was made to add water swellaable phyllosilicate to the EVOH, as taught by Tokoh, in order to retain excellent gas barrier properties and good transparency.

**7. Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Sugiura et al** (JP 10151714), and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, and further in view of **Tanaka** et al (JP 2002-172742).

The above rejection over Kuriu in view of Yamamoto, Sugiura and Matsui is incorporated here by reference.



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Kuriu fails to teach the use of a primarily aromatic polyamide layer in the same multilayer film with a primarily ethylene vinyl acetate layer. While Yamamoto teaches the use of additional layers such as polyamide [0013], the reference fails to teach specific types of polyamide, and therefore fails to teach “aromatic polyamide.”

Tanaka teaches a biaxially stretched three layer laminate with an EVOH layer, an aliphatic polyamide layer and a xylylene (i.e. aromatic) polyamide containing layer (English patent abstract). Tanaka teaches that the laminates have excellent transparency and are highly suitable for packaging food. Tanaka discloses that layers of EVOH and polyamide are often laminated for use as packaging materials, due to the high gas barrier provided by EVOH and the pinhole resistance provided by polyamide [0002]. However, when stinky items are packaged, the smell leaks, restricting the use of such laminates for many foods [0002].

Tanaka teaches that adding an aromatic polyamide layer to a laminate of EVOH and aliphatic polyamide improves the smell retaining property of the laminate [0004] and [0012].

Given that Kuriu teaches the use of the multilayer films for packaging food (column 3, lines 24-27), it would have been obvious to one of ordinary skill in the art to add a layer of aromatic polyamide, as taught by Tanaka, to the multilayer film taught by Kuriu in view of Yamamoto, Sugiura and Matsui, in order to improve the smell retaining property of the laminate.

**8. Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Matsui** et al (JP 2002-248721), as applied to claim 1 above, as evidenced by **Shibuya** et al (JP 06-345919).

The above rejection over Kuriu in view of Yamamoto, Sugiura and Matsui is incorporated here by reference.

Yamamoto teaches that the polyamide and alcohol EVOH composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

If not considered obvious that the multilayer transparent film disclosed by Kuriu in view of Yamamoto and Sugiura would inherently have the transparency and boiling resistance as recited in instant claim 27, it would have been obvious as evidenced by Shibuya.

Shibuya discloses a laminate composition comprising an inner layer of EVOH blended with polyamide and outer layers of polyamide resin (English patent abstract). Shibuya teaches that this multilayered laminate is useful as packaging for materials subject to retort or boil sterilization [0002, 0042, 0058]. Shibuya also teaches that there was no change in transparency in the three-layer laminate after 30 minutes in 95 °C water or 121 °C steam [0058 and 59].

As noted above, the multilayer film of Kuriu in view of Yamamoto, Sugiura and Matsui is identical to the presently claimed, and identical compositions must have

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identical properties. Accordingly, one of ordinary skill in the art would assume that the properties of instant claim 27 are inherent to the films of Kuriu in view of Yamamoto, Sugiura and Matsui, especially as evidenced by Shibuya.

New rejections replacing the teachings of Matsui with the teachings of Stein et al (US 2002/0040081):

**1A. Claims 1, 3-5, 8, 10, 12, 27-30, 32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), and **Toyozumi** (JP 2002-338770), and further in view of **Stein** et al (US 2002/0040081).

As to claims 1, 8, 10, 34 and 35, Kuriu discloses a multilayered film consisting of three layers: a polyamide layer, a saponified ethylene-vinyl acetate layer, and a polyamide layer (columns 3-4, examples 1 and 2). In Example 2 (column 4, lines 9-17), Kuriu teaches that the polyamide layers comprise aliphatic polyamide (nylon-6) as the principal ingredient (86.0 wt %) and aromatic polyamide (poly(m-xylylene adipamide) in an amount of 10 wt % and a modified ethylene-vinyl acetate copolymer in an amount of 4.0 wt% (column 3, lines 54-56).

Kuriu fails to teach that the saponified ethylene-vinyl acetate copolymer layer comprises polyamide resin and an alcohol based compound.

Yamamoto discloses a composition which has excellent retort resistance comprising saponified ethylene vinyl acetate (herein EVOH) mixed with a polyamide

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resin and an alcoholic compound. (English patent abstract and [0004] of machine translation). Yamamoto teaches that this composition may be formed into a film or sheet [0011] and that other materials may be layered on one or both sides [0012].

Yamamoto teaches that EVOH is commonly used as packaging in the food industry, yet it is flawed in terms of its heat resistance, shock resistance and stiffness [0002]. Yamamoto discloses that it is known in the art to blend polyamide resin with EVOH to improve the aforementioned flaws [0002]. It would have been obvious, therefore, to one of ordinary skill in the art, to blend polyamide into Kuriu's EVOH layer in order to improve the heat and shock resistance, as well as stiffness, of the film. However, Yamamoto further teaches that EVOH/polyamide compatibility issues lead to deterioration of physical properties [0003]. Yamamoto teaches that such compatibility issues can be resolved by adding an alcohol-based compound [0004]. It would have been obvious, therefore, to one of ordinary skill, to add alcohol to the film comprising a blend of EVOH and polyamide, in order to avoid deterioration of physical properties due to incompatibility.

Yamamoto and Kuriu represent analogous art. Both disclose multilayer films comprising polyamide and EVOH layers for use in food packaging. Furthermore, both are attempting to reduce stiffness in film layers (Kuriu teaches that softening improves pinhole resistance - col 1, lines 19-25). Given Yamamoto's teaching that the physical properties of EVOH, including stiffness, can be improved by adding polyamide and alcohol, it would have been obvious to one of ordinary skill in the art to modify the EVOH layer taught by Kuriu (as in example 2) by adding polyamide and alcohol, as

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taught by Yamamoto, in order to improve the heat and shock resistance, and overall stiffness of the multilayer laminate.

As discussed above, Kuriu teaches that the aliphatic polyamide layer of the multilayer film further comprises 10 wt% aromatic polyamide and 4.0 wt% of a modified ethylene-vinyl acetate copolymer (column 3, lines 54-56). Kuriu fails to teach the addition of an ethylene-methacrylic acid copolymer ionomer.

Toyozumi discloses a composition comprising saponified ethylene vinyl acetate, polyamide, and an ionomer of an ethylene methacrylic acid copolymer [claim 1], [claim 5]. (Examiner note: ionomer is translated as "eye ONOMA.")

Toyozumi teaches that blends of EVOH and polyamide have nonuniform thickness, which leads to deterioration in gas barrier ("GASUBARIA") and pinhole resistance properties [0004]. Toyozumi discloses that the addition of an olefinically unsaturated carboxylic acid copolymer solves this problem [0005]. Toyozumi teaches a preferred copolymer from ethylene [0018] and methacrylic acid [0019], and teaches various metal ions for neutralization of the ionomer [0024]. Toyozumi teaches that the best gas barrier properties and pinhole resistance are achieved when the copolymer is present between 3-15 wt% [0029].

It would have been obvious, therefore, to one of ordinary skill in the art, to add ethylene methacrylic acid copolymer ionomer, as taught by Toyozumi, to the modified ethylene vinyl acetate containing polyamide layers of the multilayer film taught by Kuriu in view of Yamamoto, in order to improve uniformity, pinhole resistance and gas barrier properties of the layer.

Kuriu teaches that the film may contain organic additives such as antioxidants and thermal stabilizers in typical amounts (col 2, lines 36-40). Kuriu fails to teach specific antioxidants, and therefore fails to disclose the presently claimed phenol-based antioxidant.

Stein discloses a synergistic blend of phosphites and hindered phenols that show superior performance in stabilizing polymers against thermooxidative deterioration during processing [0005-0008]. Stein teaches that the blend is suited for stabilizing polyamides, such as polyamide-6 [0096] as well as ethylene vinyl acetate and ethylene/acrylic acid ionomers [0090]. Stein teaches preferred blends wherein the hindered phenol component is tetrakis [methylene (3,5-di-t-butyl-4-hydroxyhydrocinnamate)] methane, which is another name for the presently claimed Pentaerythrityl-tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate). Given Kuriu's suggestion to add antioxidants and stabilizers to the polymer composition, one having ordinary skill would have consulted related prior art to determine the identity of a suitable antioxidant and/or stabilizer. Given that the laminate preparation disclosed in Kuriu involves heat treatment (extrusion, stretching up to 150 C, thermal treatment up to 220 C; Kuriu, col 2, lines 49-64), it would have been obvious to the person of ordinary skill in the art to use the phosphite/phenol stabilizer blend taught by Stein as the antioxidant or stabilizer suggested by Kuriu in order to prevent thermooxidative deterioration in the laminate made obvious by Kuriu in view of Yamamoto and Toyozumi. One would have been motivated by Stein's teaching that the performance

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of the stabilizer blend is synergistic [0001] (i.e. the total stabilizing effect is greater than the effect of the individual stabilizers).

Regarding claim 3, Yamamoto teaches the addition of silica to the EVOH resin system [0011].

Regarding instant claim 4, Yamamoto discloses that the composition is prepared by mixing a polyamide resin with an alcoholic compound and then adding EVOH to the mixture (English patent abstract and [0004] of machine translation)

Regarding instant claim 5 both Kuriu and Yamamoto [0007] teach EVOH which fulfills the recited ethylene content and degree of saponification. The EVOH used by Kuriu in examples 1 and 2 contains 32 mol% ethylene and has a 99% degree of saponification (col 3, lines 55-58).

Regarding instant claim 12, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67.

Regarding instant claim 27, Yamamoto teaches that the composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

Regarding claim 28, Yamamoto discloses the claimed ratios exactly (English patent abstract).

Regarding instant claims 29 and 30, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67. In addition, Yamamoto discloses coextrusion [0012] as well as stretching by "two axes" (i.e. biaxial stretching) [0011].

Regarding instant claim 32, the two polyamide layers taught by Kuriu in Example 2 (column 4), fulfill the recitations of the instant claim. Both polyamide layers comprise 10 wt % aromatic polyamide. Therefore, one layer reads on the recitation of "at least one polyamide layer comprising aromatic polyamide in concentration of 2.0-10 wt%," while the other layer, as it contains aromatic polyamide, reads on the recitation of "at least one additional aromatic polyamide layer."

Regarding instant claim 33, Kuriu teaches that modified ethylene-vinyl acetate copolymers include each of the members recited in the instant claim (col 2, lines 20-25).

**2A. Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Stein** et al (US 2002/0040081), as applied to claim 1 above, and further in view of **Tokoh** et al (US 5428094).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Stein is incorporated here by reference.

If it is not considered obvious to add silica to the laminate made obvious by Kuriu in view of Yamamoto in Toyozumi based on the teachings of Yamamoto, Tokoh teaches



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that adding water-swellable phyllosilicate to EVOH allows the resin to retain excellent gas barrier properties and good transparency even under highly humid conditions (col 2, lines 25-42). Given that Kuriu in view of Yamamoto, Toyozumi and Stein teach subjecting the laminate to high humidity (retort), it would have been obvious to one of ordinary skill at the time the invention was made to add water swellable phyllosilicate to the EVOH, as taught by Tokoh, in order to retain excellent gas barrier properties and good transparency.

**3A. Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Stein** et al (US 2002/0040081), as applied to claim 1 above, and further in view of **Tanaka** et al (JP 2002-172742).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Stein is incorporated here by reference.

Kuriu fails to teach the use of a primarily aromatic polyamide layer in the same multilayer film with a primarily ethylene vinyl acetate layer. While Yamamoto teaches the use of additional layers such as polyamide [0013], the reference fails to teach specific types of polyamide, and therefore fails to teach “aromatic polyamide.”

Tanaka teaches a biaxially stretched three layer laminate with an EVOH layer, an aliphatic polyamide layer and a xylylene (i.e. aromatic) polyamide containing layer

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(English patent abstract). Tanaka teaches that the laminates have excellent transparency and are highly suitable for packaging food. Tanaka discloses that layers of EVOH and polyamide are often laminated for use as packaging materials, due to the high gas barrier provided by EVOH and the pinhole resistance provided by polyamide [0002]. However, when stinky items are packaged, the smell leaks, restricting the use of such laminates for many foods [0002].

Tanaka teaches that adding an aromatic polyamide layer to a laminate of EVOH and aliphatic polyamide improves the smell retaining property of the laminate [0004] and [0012].

Given that Kuriu teaches the use of the multilayer films for packaging food (column 3, lines 24-27), it would have been obvious to one of ordinary skill in the art to add a layer of aromatic polyamide, as taught by Tanaka, to the multilayer film taught by Kuriu in view of Yamamoto, Toyozumi and Stein, in order to improve the smell retaining property of the laminate.

**4A. Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Stein** et al (US 2002/0040081), as applied to claim 1 above, as evidenced by **Shibuya** et al (JP 06-345919).

The above rejection over Kuriu in view of Yamamoto, Toyozumi and Stein is incorporated here by reference.

Yamamoto teaches that the polyamide and alcohol EVOH composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

If not considered obvious that the multilayer transparent film disclosed by Kuriu in view of Yamamoto and Toyozumi would inherently have the transparency and boiling resistance as recited in instant claim 27, it would be obvious as evidenced by Shibuya.

Shibuya discloses a laminate composition comprising an inner layer of EVOH blended with polyamide and outer layers of polyamide resin (English patent abstract). Shibuya teaches that this multilayered laminate is useful as packaging for materials subject to retort or boil sterilization [0002, 0042, 0058]. Shibuya also teaches that there was no change in transparency in the three-layer laminate after 30 minutes in 95 °C water or 121 °C steam [0058 and 59].

As noted above, the multilayer film of Kuriu in view of Yamamoto, Toyozumi and Stein is identical to the presently claimed, and identical compositions must have identical properties. Accordingly, one of ordinary skill in the art would assume that the properties of instant claim 27 are inherent to the films of Kuriu in view of Yamamoto, Toyozumi and Stein, especially as evidenced by Shibuya.

**5A. Claims 1, 3-5, 8, 10, 12, 27-30, 32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640,

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will be cited herein) in view of **Yamamoto** et al (JP 11-199741), and **Sugiura et al** (JP 10151714; included machine translation cited herein), and further in view of **Stein** et al (US 2002/0040081).

As to claims 1, 8, 10, 34 and 35, Kuriu discloses a multilayered film consisting of three layers: a polyamide layer, a saponified ethylene-vinyl acetate layer, and a polyamide layer (columns 3-4, examples 1 and 2). In Example 2 (column 4, lines 9-17), Kuriu teaches that the polyamide layers comprise aliphatic polyamide (nylon-6) as the principal ingredient (86.0 wt %) and aromatic polyamide (poly(m-xylylene adipamide) in an amount of 10 wt % and a modified ethylene-vinyl acetate copolymer in an amount of 4.0 wt% (column 3, lines 54-56).

Kuriu fails to teach that the saponified ethylene-vinyl acetate copolymer layer comprises polyamide resin and an alcohol based compound.

Yamamoto discloses a composition which has excellent retort resistance comprising saponified ethylene vinyl acetate (herein EVOH) mixed with a polyamide resin and an alcoholic compound. (English patent abstract and [0004] of machine translation). Yamamoto teaches that this composition may be formed into a film or sheet [0011] and that other materials may be layered on one or both sides [0012].

Yamamoto teaches that EVOH is commonly used as packaging in the food industry, yet it is flawed in terms of its heat resistance, shock resistance and stiffness [0002]. Yamamoto discloses that it is known in the art to blend polyamide resin with EVOH to improve the aforementioned flaws [0002]. It would have been obvious, therefore, to one of ordinary skill in the art, to blend polyamide in the EVOH layer of

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Kuriu in order to improve the heat and shock resistance, as well as stiffness, of the film. However, Yamamoto further teaches that EVOH/polyamide compatibility issues lead to deterioration of physical properties [0003]. Yamamoto teaches that such compatibility issues can be resolved by adding an alcohol-based compound [0004]. It would have been obvious, therefore, to one of ordinary skill, to add alcohol to the film comprising a blend of EVOH and polyamide, in order to avoid deterioration of physical properties due to incompatibility.

Yamamoto and Kuriu represent analogous art. Both disclose multilayer films comprising polyamide and EVOH layers for use in food packaging. Furthermore, both are attempting to reduce stiffness in film layers (Kuriu teaches that softening improves pinhole resistance - col 1, lines 19-25). Given Yamamoto's teaching that the physical properties of EVOH, including stiffness, can be improved by adding polyamide and alcohol, it would have been obvious to one of ordinary skill in the art to modify the EVOH layer taught by Kuriu (as in example 2) by adding polyamide and alcohol, as taught by Yamamoto, in order to improve the heat and shock resistance, and overall stiffness of the multilayer laminate.

Kuriu teaches that, in order to give flexibility and pinhole resistance to a polyamide resin layer, a modified ethylene vinyl acetate copolymer may be added in an amount of 1 to 15 wt % (col 2, lines 1-25). However, Kuriu fails to teach the addition of an ethylene-methacrylic acid copolymer ionomer to the polyamide layer.

Sugiura teaches a laminate comprising a layer of a polyamide resin blended with 0.3-15 wt% of a flexible polymer, laminated to a layer of thermoplastic resin, such as

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EVOH, polyamide or a mixture (esp@cenet abstract, submitted by Applicant; also [0024]). Like Kuriu and Yamamoto, Sugiura teaches that the lamination film is suited for use in food packaging [0044].

Sugiura teaches that the addition of the flexible polymer to the polyamide prevents abrasive separation (abstract, [0021]). In addition, the laminate has excellent pinhole resistance, pliability and strength [0044]. As the flexible polymer, Sugiura teaches that ethylene vinyl acetate copolymer, or a mixture of ethylene vinyl acetate copolymer with an ethylenic methacrylic ionomer are preferred [0012, 0018, 0019].

In view of Sugiura's recognition that, for the purpose of flexibilizing polyamide resin, ethylene vinyl acetate copolymer is equivalent and interchangeable with a mixture of ethylene vinyl acetate copolymer with an ethylenic methacrylic ionomer, it would have been obvious to one of ordinary skill in the art to substitute the ethylene vinyl acetate copolymer component in the polyamide layer taught by Kuriu (in col 2, lines 9-25) in view of Yamamoto with a mixture of ethylene vinyl acetate copolymer and an ethylenic methacrylic ionomer, and thereby arrive at the present invention. Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

Kuriu teaches that the film may contain organic additives such as antioxidants and thermal stabilizers in typical amounts (col 2, lines 36-40). Kuriu fails to teach

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specific antioxidants, and therefore fails to disclose the presently claimed phenol-based antioxidant.

Stein discloses a synergistic blend of phosphites and hindered phenols that show superior performance in stabilizing polymers against thermooxidative deterioration during processing [0005-0008]. Stein teaches that the blend is suited for stabilizing polyamides, such as polyamide-6 [0096] as well as ethylene vinyl acetate and ethylene/acrylic acid ionomers [0090]. Stein teaches preferred blends wherein the hindered phenol component is tetrakis [methylene (3,5-di-*t*-butyl-4-hydroxyhydrocinnamate)] methane, which is another name for the presently claimed Pentaerythrityl-tetrakis(3-(3,5-di-*tert*-butyl-4-hydroxyphenyl)propionate). Given Kuriu's suggestion to add antioxidants and stabilizers to the polymer composition, one having ordinary skill would have consulted related prior art to determine the identity of a suitable antioxidant and/or stabilizer. Given that the laminate preparation disclosed in Kuriu involves heat treatment (extrusion, stretching up to 150 C, thermal treatment up to 220 C; Kuriu, col 2, lines 49-64), it would have been obvious to the person of ordinary skill in the art to use the phosphite/phenol stabilizer blend taught by Stein as the antioxidant or stabilizer suggested by Kuriu in order to prevent thermooxidative deterioration in the laminate made obvious by Kuriu in view of Yamamoto and Sugiura. One would have been motivated by Stein's teaching that the performance of the stabilizer blend is synergistic [0001] (i.e. the total stabilizing effect is greater than the effect of the individual stabilizers).

Regarding claim 3, Yamamoto teaches the addition of silica to the EVOH resin system [0011].

Regarding instant claim 4, Yamamoto discloses that the composition is prepared by mixing a polyamide resin with an alcoholic compound and then adding EVOH to the mixture (English patent abstract and [0004] of machine translation)

Regarding instant claim 5 both Kuriu and Yamamoto [0007] teach EVOH which fulfills the recited ethylene content and degree of saponification. The EVOH used by Kuriu in examples 1 and 2 contains 32 mol% ethylene and has a 99% degree of saponification (col 3, lines 55-58).

Regarding instant claim 12, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67.

Regarding instant claim 27, Yamamoto teaches that the composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

Regarding claim 28, Yamamoto discloses the claimed ratios exactly (English patent abstract).

Regarding instant claims 29 and 30, Kuriu teaches that the multilayer film is produced by coextrusion (col 2, line 50) and biaxial stretching (col 2, line 62). See also Example 1, col 3, lines 60-67. In addition, Yamamoto discloses coextrusion [0012] as well as stretching by “two axes” (i.e. biaxial stretching) [0011].



Regarding instant claim 32, the two polyamide layers taught by Kuriu in Example 2 (column 4), fulfill the recitations of the instant claim. Both polyamide layers comprise 10 wt % aromatic polyamide. Therefore, one layer reads on the recitation of "at least one polyamide layer comprising aromatic polyamide in concentration of 2.0-10 wt%," while the other layer, as it contains aromatic polyamide, reads on the recitation of "at least one additional aromatic polyamide layer."

Regarding instant claim 33, Kuriu teaches that modified ethylene-vinyl acetate copolymers include each of the members recited in the instant claim (col 2, lines 20-25).

Regarding instant claim 35, Kuriu teaches 1 to 15 wt % of flexibilizing modified ethylene vinyl acetate copolymer in the polyamide resin layer. In substituting a mixture of ethylene-vinyl acetate copolymer and ethylene methacrylic ionomer (as made obvious by Sugiura), one would immediately envisage a 1:1 mixture of the two components, adding up to 1 to 15 wt%. As such, the ranges recited in instant claim 35 are deemed obvious.

**6A. Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto et al** (JP 11-199741), **Sugiura et al** (JP 10151714) and **Stein et al** (US 2002/0040081), as applied to claim 1 above, and further in view of **Tokoh et al** (US 5428094).

The above rejection over Kuriu in view of Yamamoto, Sugiura and Stein is incorporated here by reference.

If it is not considered obvious to add silica to the laminate made obvious by Kuriu in view of Yamamoto, Sugiura and Stein, Tokoh teaches that adding water-swellaable phyllosilicate to EVOH allows the resin to retain excellent gas barrier properties and good transparency even under highly humid conditions (col 2, lines 25-42). Given that Kuriu in view of Yamamoto, Sugiura and Stein teach subjecting the laminate to high humidity (retort), it would have been obvious to one of ordinary skill at the time the invention was made to add water swellaable phyllosilicate to the EVOH, as taught by Tokoh, in order to retain excellent gas barrier properties and good transparency.

**7A. Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto et al** (JP 11-199741), **Sugiura et al** (JP 10151714), and **Stein et al** (US 2002/0040081), as applied to claim 1 above, and further in view of **Tanaka et al** (JP 2002-172742).

The above rejection over Kuriu in view of Yamamoto, Sugiura and Stein is incorporated here by reference.

Kuriu fails to teach the use of a primarily aromatic polyamide layer in the same multilayer film with a primarily ethylene vinyl acetate layer. While Yamamoto teaches the use of additional layers such as polyamide [0013], the reference fails to teach specific types of polyamide, and therefore fails to teach "aromatic polyamide."

Tanaka teaches a biaxially stretched three layer laminate with an EVOH layer, an aliphatic polyamide layer and a xylylene (i.e. aromatic) polyamide containing layer (English patent abstract). Tanaka teaches that the laminates have excellent transparency and are highly suitable for packaging food. Tanaka discloses that layers of EVOH and polyamide are often laminated for use as packaging materials, due to the high gas barrier provided by EVOH and the pinhole resistance provided by polyamide [0002]. However, when stinky items are packaged, the smell leaks, restricting the use of such laminates for many foods [0002].

Tanaka teaches that adding an aromatic polyamide layer to a laminate of EVOH and aliphatic polyamide improves the smell retaining property of the laminate [0004] and [0012].

Given that Kuriu teaches the use of the multilayer films for packaging food (column 3, lines 24-27), it would have been obvious to one of ordinary skill in the art to add a layer of aromatic polyamide, as taught by Tanaka, to the multilayer film taught by Kuriu in view of Yamamoto, Sugiura and Stein, in order to improve the smell retaining property of the laminate.

**8A. Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuriu** (WO00/56548, the US patent equivalent, 6645640, will be cited herein) in view of **Yamamoto** et al (JP 11-199741), **Toyozumi** (JP 2002-338770), and **Stein** et al (US 2002/0040081), as applied to claim 1 above, as evidenced by **Shibuya** et al (JP 06-345919).

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The above rejection over Kuriu in view of Yamamoto, Sugiura and Stein is incorporated here by reference.

Yamamoto teaches that the polyamide and alcohol EVOH composition has excellent transparency and retorting resistance (English abstract), and teaches the use of nylon 6 for the polyamide resin in the EVOH layer [0005, 2<sup>nd</sup> line].

If not considered obvious that the multilayer transparent film disclosed by Kuriu in view of Yamamoto and Sugiura would inherently have the transparency and boiling resistance as recited in instant claim 27, it would have been obvious as evidenced by Shibuya.

Shibuya discloses a laminate composition comprising an inner layer of EVOH blended with polyamide and outer layers of polyamide resin (English patent abstract). Shibuya teaches that this multilayered laminate is useful as packaging for materials subject to retort or boil sterilization [0002, 0042, 0058]. Shibuya also teaches that there was no change in transparency in the three-layer laminate after 30 minutes in 95 °C water or 121 °C steam [0058 and 59].

As noted above, the multilayer film of Kuriu in view of Yamamoto, Sugiura and Stein is identical to the presently claimed, and identical compositions must have identical properties. Accordingly, one of ordinary skill in the art would assume that the properties of instant claim 27 are inherent to the films of Kuriu in view of Yamamoto, Sugiura and Stein, especially as evidenced by Shibuya.

***Response to Arguments***

In the remarks filed 11/19/10, Applicant indicates that claims 34 and 35 have been amended. Examiner is unable to determine how claims 34 and 35 have been amended from the claims filed 1/4/10. It is noted that the status of both claims is “previously presented.” It is assumed that Applicant intended to amend the claims to specify units. As the claims still lack units, the rejection under 35 USC 112 2nd paragraph is maintained.

Regarding Applicant’s data in the originally filed specification and data in the declaration filed 11/19/10:

Applicant has submitted data (on 11/19/10) allegedly showing that polyamide having a phenol-based antioxidant shows unexpectedly superior ability to retain transparency after retort, relative to other antioxidant compounds. Applicant’s data is unpersuasive for the following reasons:

- It is unclear whether the differences in haze values measured by Applicant in the declaration filed 11/19/10 are statistically significant. The haze measured for the film containing phenol antioxidant is 5.0 before and after retort. The haze measured for the comparative phosphite and sulfur antioxidants is 5.3 before retort and 6.0 or 6.1 after retort. Applicant has only provided one data point for each of the three films before and after retort. As evidence that more data points are needed to establish whether the results are statistically

- significant, Applicant's attention is drawn to the data in the original specification. Examples 1 and 2 are three layer laminates having the same polymer/antioxidant compositions. They differ only in the thicknesses of each layer. Example 1 shows the same haze before and after retort (6.8), while the haze of example 2 *decreases* from 6.4 to 4.8 after retort. The observed decrease in example 2 but not example 1 must be due to measurement variation, not from the slight difference in layer thickness, as both examples contain the same antioxidant and polymer composition. It is therefore evident that the haze differences observed in the antioxidant comparison submitted 11/19/10 (which are smaller than the 1.6 decrease observed after retort in example 2) could be due to measurement variation.
- Applicant's data submitted 11/19/10 is not commensurate in scope with the claims. Applicant has provided data on the effect of antioxidant on an aliphatic polyamide (polyamide-6). It is appreciated that Applicant chose to provide data on a simpler polymer composition than claimed in an attempt to clearly demonstrate the effect of the antioxidant. However, the presently claimed antioxidant-containing polyamide layer requires, in addition to aliphatic polymer, an aromatic polyamide, a modified EVA copolymer and an ethylene-methacrylic ionomer. Even if Applicant were to persuasively show that a phenolic antioxidant has unexpectedly superior performance in pure polyamide-6 films, the data would be insufficient to establish unexpected results in the claimed, more complex, polyamide/EVA/ionomer composition.

It is not clear whether the same effect would be observed with the additional claimed polymeric components.

- Additionally, as further evidence that the data on polyamide-6 does not necessarily correlate to the performance of the claimed polyamide composition, Applicant's attention is drawn to the data provided for comparative example 3 in the original specification. It is assumed that comparative example 3 contains antioxidant, as comparative example 4 clearly states that there is no antioxidant, while there is no such statement in the description of comparative example 3. Despite having antioxidant, comparative example 3 exhibits an increase in haze from 5.0 to 6.0 after retort. If polyamide-6 were truly representative of the claimed polymer composition, one would predict that the haze of comparative example 3 would not increase after retort, based on the data provided by Applicant on 11/19/10. As this is not the case, it is evident that the performance of the presently claimed laminates does not necessarily correlate to the performance of the polyamide 6 films in the data provided on 11/19/10.
- It is further noted that Applicant has only provided data on one specific phenolic antioxidant, one specific phosphite antioxidant, and one specific sulfur antioxidant. Independent claim 1 has been amended to recite a broad genus (phenol-based antioxidant). In order to establish that phenol-based antioxidants have unexpectedly superior performance in the claimed composition as compared to sulfur and phosphite antioxidants, Applicant

would need to provide data comparing additional phenol, sulfur and phosphite antioxidants in order to ensure that the unexpected results are commensurate in scope with the broader genus of phenol-based antioxidants, as claimed.

Applicant would need to provide a sufficient number of data points to ensure that the results are representative of all phenol, sulfur and phosphite antioxidants as opposed to the three specific compounds tested in the data submitted 11/19/10.

- Furthermore, an additional rejection has been made (incorporating teachings of Stein et al) showing that it would have been obvious to use a combination of phenol and phosphite antioxidants. Applicant's data is insufficient to overcome this rejection, as a phenol/phosphite antioxidant combination is within the scope of the present claims, and the superior performance of a phenol/phosphite combination in preventing degradation of polyamide would have been expected in the art, based on the disclosure of Stein. If evidence is necessary to support the assertion that one of ordinary skill in the art at the time of the invention would have expected that preventing polymer degradation would also prevent haze formation, Ram (in Fundamentals of Polymer Engineering, Plenum Press, 1997, pp 88-89) teaches that any chemical change in a polymer like degradation or oxidation may reduce light transmission (p 89, 2nd paragraph).



In view of the above discussion, it is evident that Applicant has not established unexpected results. Therefore, Applicant's arguments that the claims are non-obvious due to the superior properties which are unexpected over the teachings of the cited references are unpersuasive.

Applicant's submission of a corrected translation for comparative example 4 and amendment to the specification is acknowledged. Based on the corrected description of comparative example 4, Examiner acknowledges that comparative example 4 properly represents a composition which is the same as Example 1, except for the omission of antioxidant.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RACHEL KAHN whose telephone number is (571)270-7346. The examiner can normally be reached on Monday to Friday 8:00 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/R. K./  
Examiner, Art Unit 1766

/RANDY GULAKOWSKI/  
Supervisory Patent Examiner, Art Unit 1766